

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY

NEUTRALLY BUOYANT FLOATS

Serial Nos. 140 - 160

March - April 1964

TABLES AND DIAGRAMS

G. F. CASTON

and

J. C. SWALLOW

N.I.O. INTERNAL REPORT No. D.9

January 1972

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NEUTRALLY BUOYANT FLOATS
SERIAL Nos. 140 - 160
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Tables of times and positions.
Diagrams showing trajectories
and components of displacement.

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C O N T E N T S

		<u>Page No</u>
1.	INTRODUCTION	1
2.	LIST OF FLOATS	2
3.	REFERENCES	2
4.	FLOAT DIAGRAMS AND TABLES	
	Float Serial Nos: 140	3-4
	141	5-6
	142	7-8
	143	9-10
	144	11-12
	145	13-14
	146	15-16
	147	17-18
	148	19-20
	149	21-22
	150	23-24
	151	25-26
	152	27-28
	153	29-30
	154	31-32
	155	33-34
	156	35-36
	157	37-38
	158	39-40
	159	41-42
	160	43-44

Introduction

All the float trajectories described in this report were observed from the R.R.S. "Discovery" in the Indian Ocean during March-April 1964, when hydrographic and biological stations were being worked in north-south sections to 20°S in longitudes 58°E and 67½°E. From time to time during these sections, a buoy was anchored and observations were made near it, usually for 24 hours, sometimes longer. Usually, floats were launched, loaded for 1000m and 2000m nominal depths, and tracked relative to the anchored buoy. Absolute positions depended on celestial fixes ($\pm$ 1km. approx); relative motion of the anchored buoy was detected by overlapping successive bathymetric sounding runs. The float trajectories are relatively short, ranging from 12½ to 62 hours duration. The methods of tracking and depth determination were those described in Ref.1. As in previous reports in this series, the floats have been re-numbered in chronological order. Some comments on these float results, and other observations made at the same time, can be found in the cruise report (Ref.2.).

LIST OF FLOATS

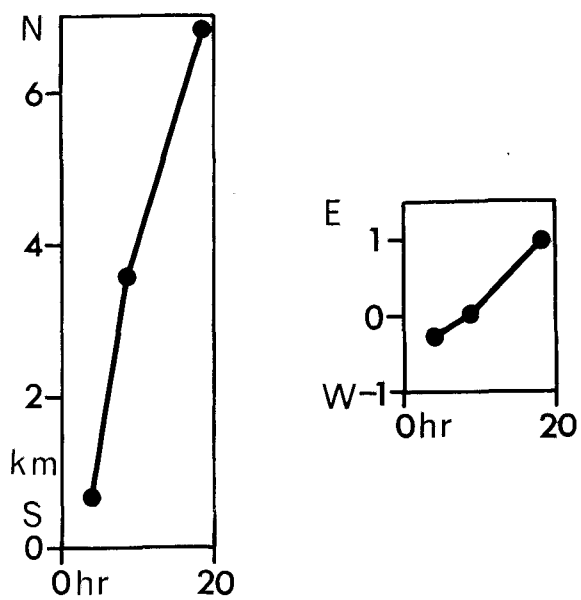
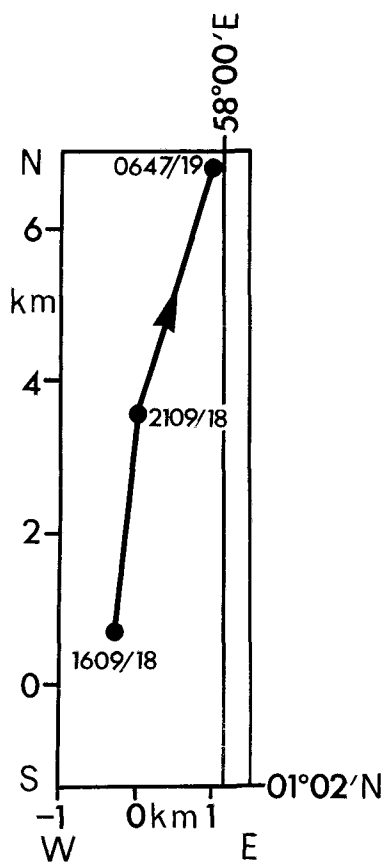
Serial No.	Original Designation	Date and time laid
140	J	1222/18.III.64
141	A	1304/18.III.64
142	L	1718/20.III.64
143	M	1817/20.III.64
144	B	1339/26.III.64
145	D	1410/26.III.64
146	E	1738/28.III.64
147	F	1800/28.III.64
148	18	1145/31.III.64
149	26	1214/31.III.64
150	8	1240/31.III.64
151	21	1629/15.IV.64
152	15	1651/15.IV.64
153	22	0850/18.IV.64
154	13	0915/18.IV.64
155	20	1941/20.IV.64
156	29	2000/20.IV.64
157	X	0843/25.IV.64
158	16	0910/25.IV.64
159	17	1846/27.IV.64
160	28	1910/27.IV.64

REFERENCES

1. Swallow, J.C. and L.V. Worthington, 1961. An observation of a deep countercurrent in the Western North Atlantic. Deep-Sea Research Vol. 8, pp.1-19.
2. Royal Society, 1965. Cruise Report, R.R.S. 'Discovery' I.I.O.E. Cruise 3.

FLOAT DESIGNATION : J

Date and time laid : 1222/18.111.64.



SERIAL No: 140

FLOAT DESIGNATION: J (station 5275) Date and time laid: 1222/18.III.64

Position laid: 1° 02'.6N
57° 59'.3E

Displacement origin: 1° 02'.6N
57° 59'.3E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.2 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 2000 1980 ±460 ±190

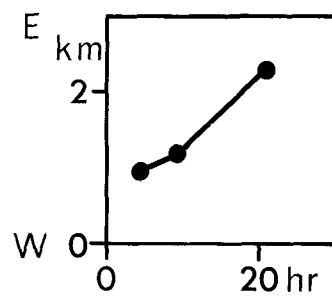
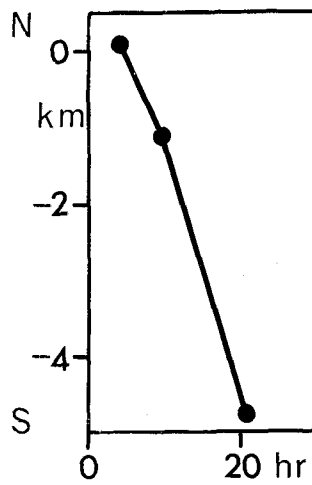
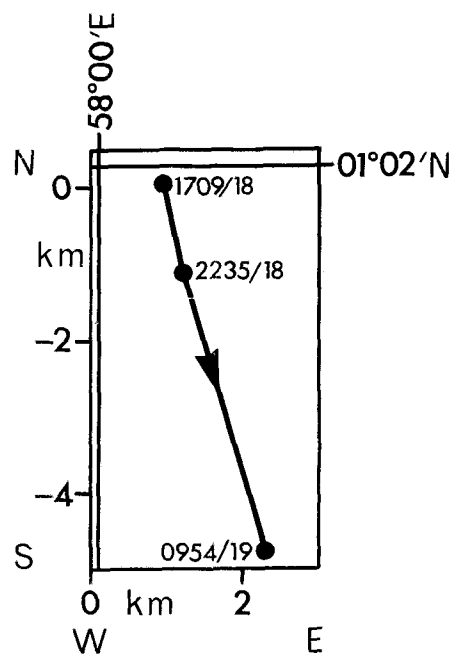
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.N.	Long.E.		+E-W	+N-S		
1	18.I I	1609	1°03'.0	57°59'.1	3.8	-0.3	+0.65	16.7	006
2	18.III	2109	1°04'.6	57°59'.3	8.8	0.0	+3.55	10.4	018
3	19.III	0647	1°06'.4	57°59'.9	18.4	+1.0	+6.8		

Mean speed along trajectory = 12.5 cm/sec

Mean velocity, fixes 1 - 3, = 12.3 cm/sec, 012°T

FLOAT DESIGNATION : A

Date and time laid : 1304/18.111.64.



SERIAL No: 141

FLOAT DESIGNATION: A (station 5275) Date and time laid: 1304/18.III.64

Position laid: 1° 01'.8N Displacement origin: 1° 01'.8N
58° 00'.0E 58° 00'.0E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.2 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
1000 950 ± 150 ± 55

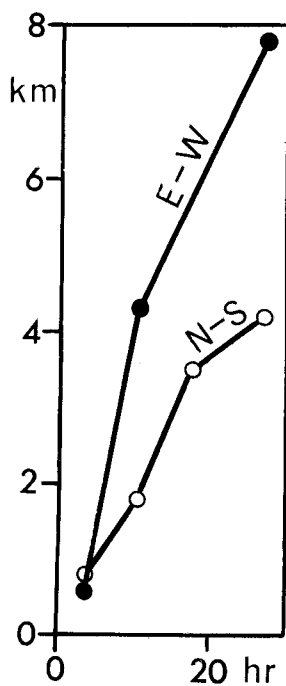
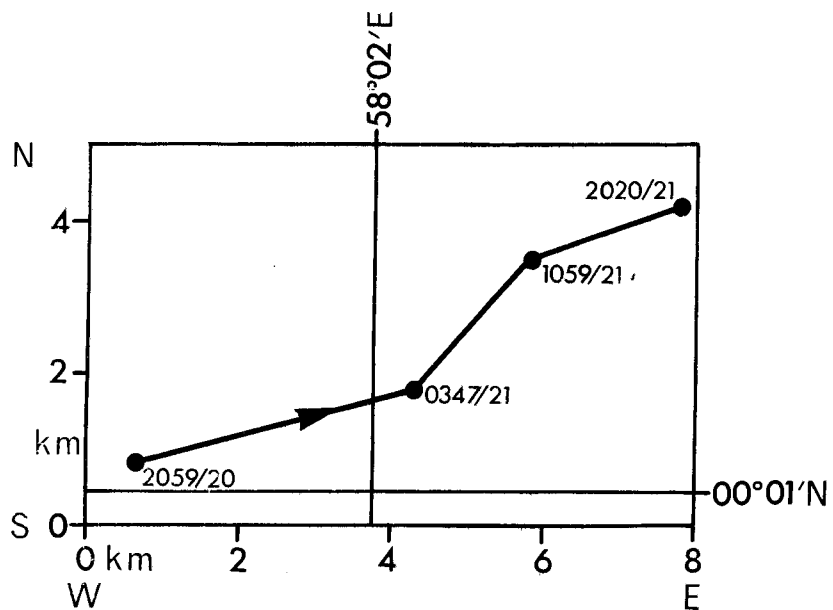
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.N.	Long.E.		+E-W x	+N-S y		
1	18.III	1709	1°01'.9	58°00'.5	4.1	+0.95	+0.1	6.6	167
2	18.III	2235	1°01'.2	58°00'.65	9.5	+1.2	-1.1	9.8	164
3	19.III	0954	0°59'.2	58°01'.2	20.85	+2.3	-4.8		

Mean speed along trajectory = 8.8 cm/sec

Mean velocity, fixes 1 - 3, = 8.6 cm/sec, 165°T

FLOAT DESIGNATION : L

Date and time laid 1718/20.111.64.



SERIAL No: 142

FLOAT DESIGNATION: L (station 5281) Date and time laid: 1718/20.III.64

Position laid: 0° 00' .7N
57° 59' .9E

Displacement origin: 0° 00' .7N
57° 59' .9E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.3 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 2000 1900 ± 450 ± 140

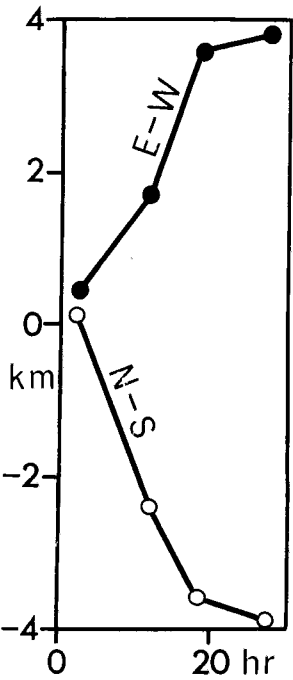
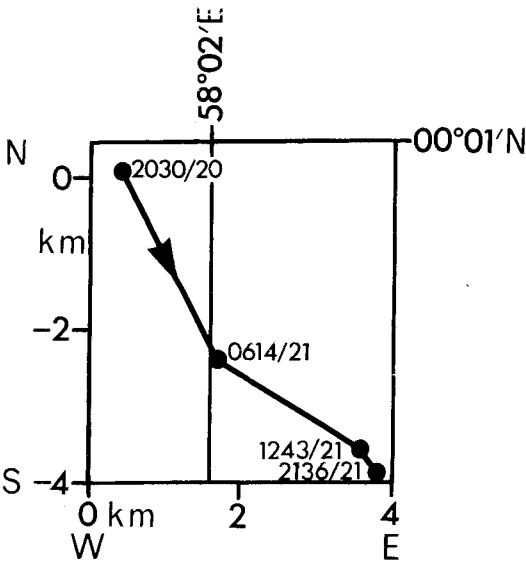
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.N.	Long.E.		+E-W x	+N-S y		
1	20.III	2059	0°01' .2	58°00' .3	3.7	+0.6	+0.8	16.4	075
2	21.III	0347	0°01' .7	58°02' .3	10.5	+4.3	+1.8	8.5	041
3	21.III	1059	0°02' .7	58°03' .2	17.7	+5.8	+3.5	6.5	068
4	21.III	2020	0°03' .1	58°04' .3	27.05	+7.8	+4.2		

Mean speed along trajectory = 10.0 cm/sec

Mean velocity, fixes 1 - 4, = 9.6 cm/sec, 065°T

FLOAT DESIGNATION : M

Date and time laid : 1817/20.111.64.



SERIAL No: 143

FLOAT DESIGNATION: M (station 5281) Date and time laid: 1817/20.III.64

Position laid: 0°00'·7N Displacement origin: 0°00'·7N
58° 01'·1E 58° 01'·1E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.3 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
1000 1170 ± 270 ± 75

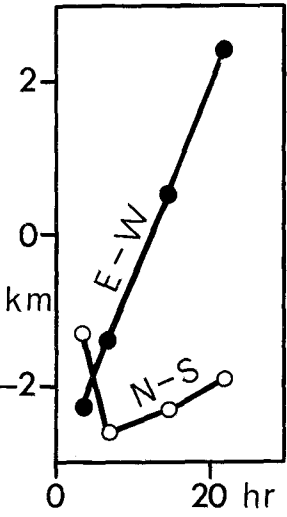
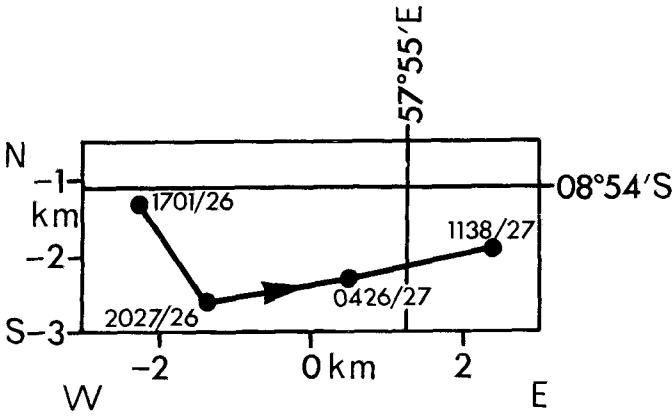
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.	Long.E.		+E-W x	+N-S y		
1	20.III	2030	0°00'·8N	58°01'·4	2.2	+0.4	+0.1	8.3	154
2	21.III	0614	0°00'·6S	58°02'·05	11.95	+1.7	-2.4	9.8	121
3	21.III	1243	0°01'·3S	58°03'·1	18.45	+3.6	-3.6	0.9	152
4	21.III	2136	0°01'·45S	58°03'·2	27.3	+3.8	-3.9		

Mean speed along trajectory = 6.1 cm/sec

Mean velocity, fixes 1 - 4, = 5.9 cm/sec, 140°T

FLOAT DESIGNATION : B

Date and time laid : 1339/26.111.64.



SERIAL No: 144

FLOAT DESIGNATION: B (station 5298) Date and time laid: 1339/26.III.64

Position laid: 8° 53' .4S Displacement origin: 8° 53' .4S
57° 54' .35E 57° 54' .35E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.3 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
1000 1620 ± 350 ± 120

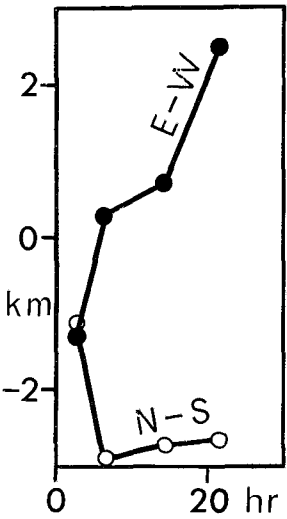
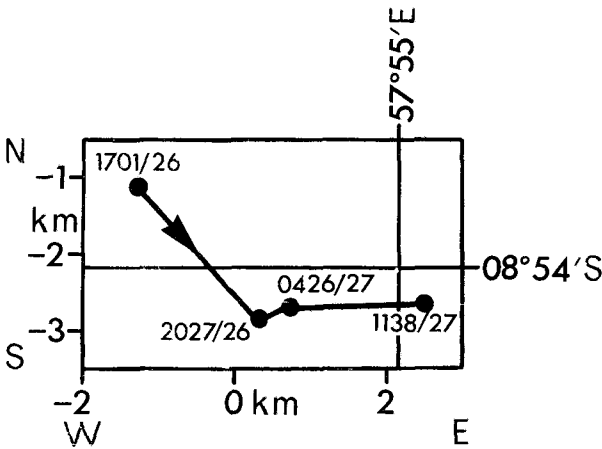
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	26.III	1701	8°54' .1	57°53' .05	3.35	-2.3	-1.3	13.7	147
2	26.III	2027	8°54' .9	57°53' .6	6.8	-1.4	-2.6	7.0	081
3	27.III	0426	8°54' .7	57°54' .6	14.8	+0.5	-2.3	7.7	077
4	27.III	1138	8°54' .5	57°55' .7	22.0	+2.4	-1.9		

Mean speed along trajectory = 8.5 cm/sec

Mean velocity, fixes 1 - 4, = 7.3 cm/sec, 098°T

FLOAT DESIGNATION : D

Date and time laid : 1410/26.111.64.



SERIAL No: 145

FLOAT DESIGNATION: D (station 5298) Date and time laid: 1410/26.III.64

Position laid: 8° 52'.8S
57° 53'.8E

Displacement origin: 8° 52'.8S
57° 53'.8E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.3 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 2000 2010 ± 65 ± 40

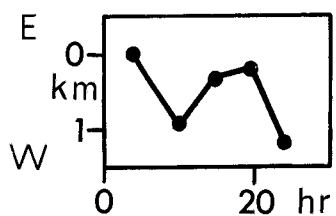
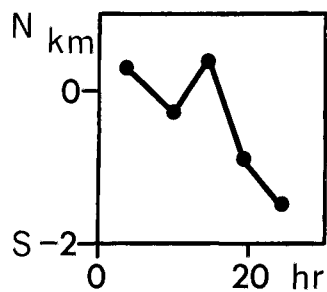
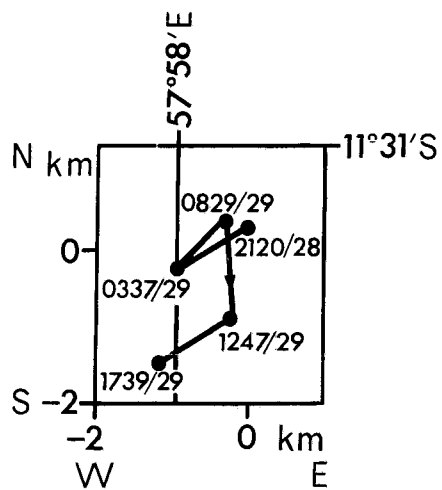
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	26.III	1701	8°53'.4	57°53'.0	2.85	-1.3	-1.1	20.1	137
2	26.III	2027	8°54'.4	57°53'.95	6.3	+0.3	-2.9	1.7	066
3	27.III	0426	8°54'.3	57°54'.2	14.25	+0.7	-2.7	7.0	087
4	27.III	1138	8°54'.3	57°55'.2	21.45	+2.5	-2.65		

Mean speed along trajectory = 7.2 cm/sec

Mean velocity, fixes 1 - 4, = 6.4 cm/sec, 112°T

FLOAT DESIGNATION : E

Date and time laid : 1738/28.111.64.



SERIAL No: 146

FLOAT DESIGNATION: E (station 5803) Date and time laid: 1738/28.III.64

Position laid: 11° 31'.8S Displacement origin: 11° 31'.8S
57° 58'.5E 57° 58'.5E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.5 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
2000 2320 ± 430 ± 120

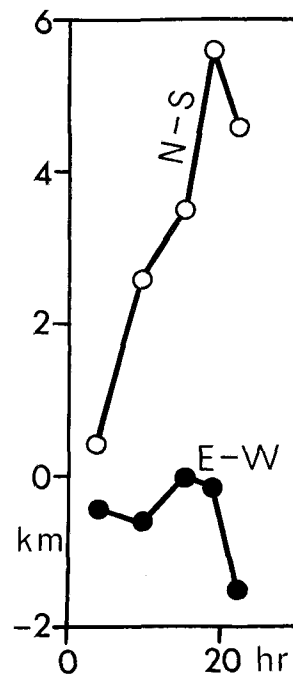
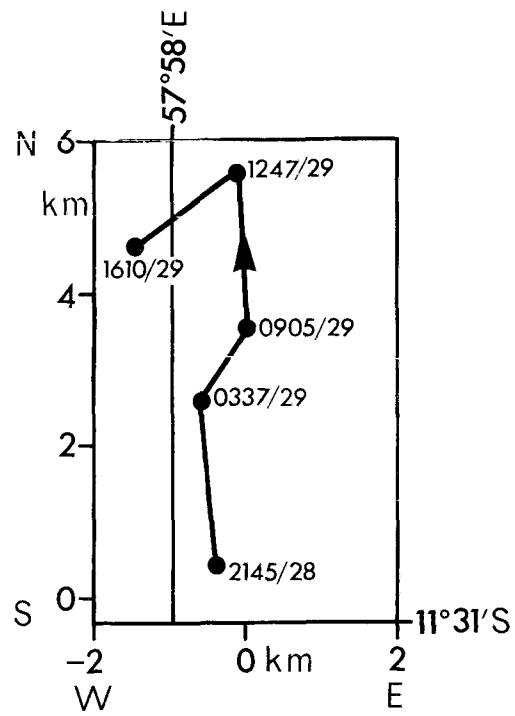
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	28.III	2120	11°31'.6	57°58'.5	3.7	0.0	+0.3	5.3	235
2	29.III	0337	11°32'.0	57°58'.0	10.0	-0.95	-0.3	6.3	045
3	29.III	0629	11°31'.6	57°58'.35	14.85	-0.3	+0.4	8.4	176
4	29.III	1247	11°32'.3	57°58'.4	19.15	-0.2	-0.9	6.9	238
5	29.III	1739	11°32'.65	57°57'.8	24.00	-1.2	-1.5		

Mean speed along trajectory = 6.6 cm/sec

Mean velocity, fixes 1 - 5, = 3.0 cm/sec, 212°T

FLOAT DESIGNATION : F

Date and time laid : 1800/28.11.64.



FLOAT DESIGNATION: F (station 5305) Date and time laid: 1800/28.III.64
 Position laid: 11° 30'·9S Displacement origin: 11° 30'·9S
 57° 58'·5E 57° 58'·5E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.5 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 1000 1330 ± 320 ± 100

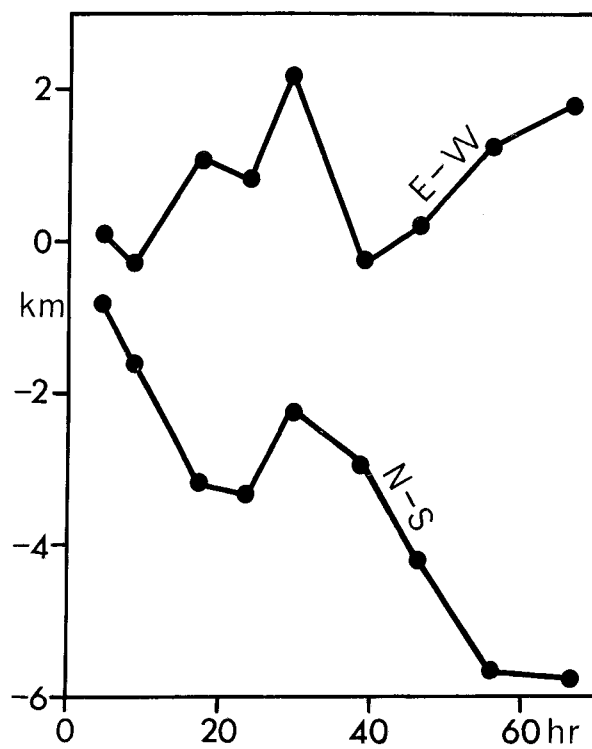
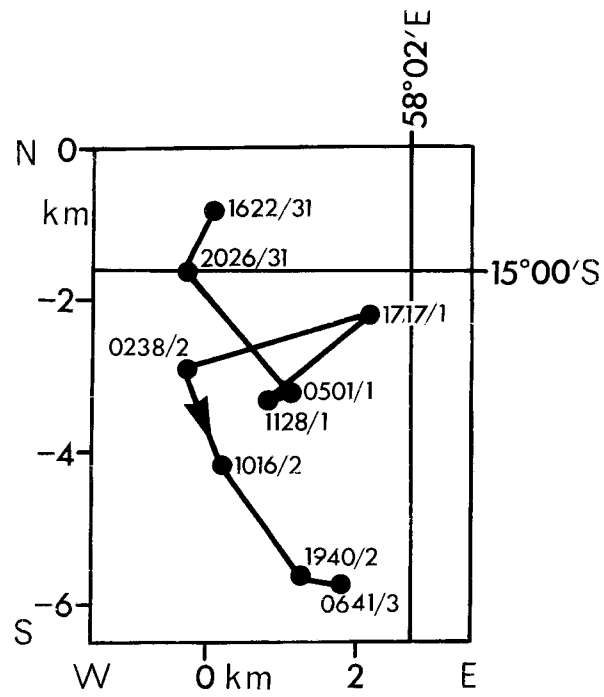
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	28.III	2145	11°30'·6	57°58'·3	3.75	-0.4	+0.4	10.9	355
2	29.III	0337	11°29'·4	57°58'·2	9.6	-0.6	+2.6	5.6	030
3	29.III	0905	11°28'·9	57°58'·5	15.1	0.0	+3.5	16.5	358
4	29.III	1247	11°27'·7	57°58'·5	18.8	-0.1	+5.6	14.7	234
5	29.III	1610	11°26'·3	57°57'·7	22.15	-1.5	+4.55		

Mean speed along trajectory = 11.2 cm/sec

Mean velocity, fixes 1 - 5, = 6.6 cm/sec, 345°T

FLOAT DESIGNATION : 18

Date and time laid : 1145/31.111.64.



SERIAL No: 148

FLOAT DESIGNATION: 13 (station 5310) Date and time laid: 1145/31.III.64

Position laid: 14° 59' .1S
50° 00' .4E

Displacement origin: 14° 59' .1S
50° 00' .4E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.3 km (relative)

Depth(m):	Nominal	Observed	S.D.	S.D.(mean)
	1000	1250	± 160	± 40

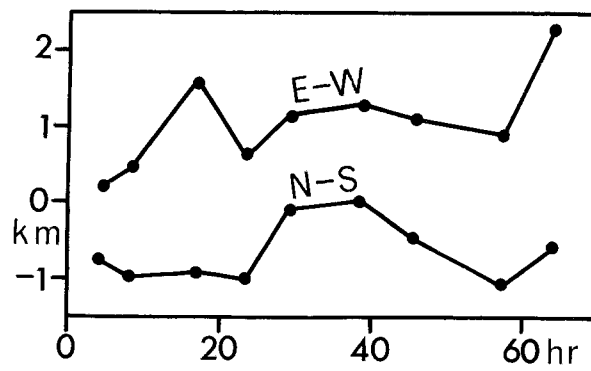
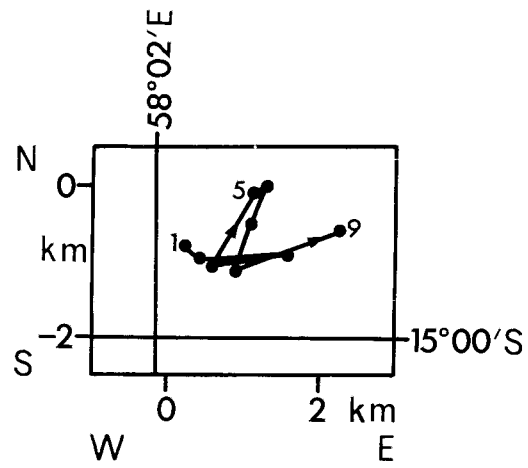
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	31.III	1622	14°59' .6	58°00' .45	4.6	+0.1	-0.8	6.2	208
2	31.III	2025	15°00' .0	58°00' .2	8.7	-0.3	-1.6	7.1	140
3	1.IV	0501	15°00' .9	58°01' .0	17.25	+1.1	-3.2	1.7	246
4	1.IV	1128	15°01' .0	58°00' .8	23.7	+0.8	-3.35	9.1	052
5	1.IV	1717	15°00' .35	58°01' .7	29.55	+2.2	-2.2	8.0	254
6	2.IV	0238	15°00' .8	58°00' .2	38.9	-0.3	-2.9	5.1	159
7	2.IV	1016	15°01' .5	58°00' .5	46.5	+0.2	-4.2	5.3	142
8	2.IV	1940	15°02' .3	58°01' .1	55.9	+1.25	-5.65	1.5	101
9	3.IV	0641	15°02' .35	58°01' .45	66.95	+1.8	-5.75		

Mean speed along trajectory = 5.3 cm/sec

Mean velocity, fixes 1 - 9, = 2.4 cm/sec, 161°T

FLOAT DESIGNATION : 26

Date and time laid : 1214/31.111.64.



FLOAT DESIGNATION: 26 (station 5310) Date and time laid: 1214/31.III.64

Position laid: 14° 59' .2S
58° 02' .05E

Displacement origin: 14° 59' .2S
58° 02' .05E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.3 km (relative)

Depth(m):	Nominal	Observed	S.D.	S.D.(mean)
	2000	2050	± 270	± 70

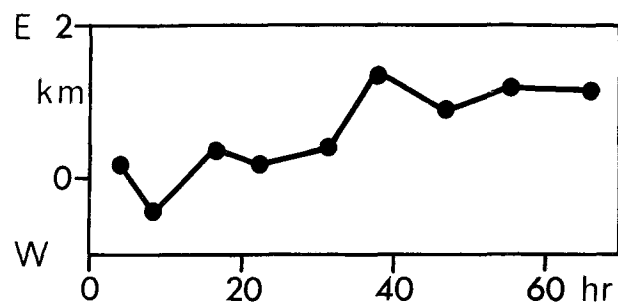
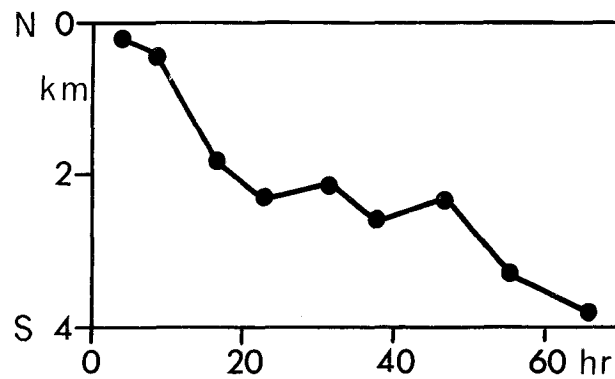
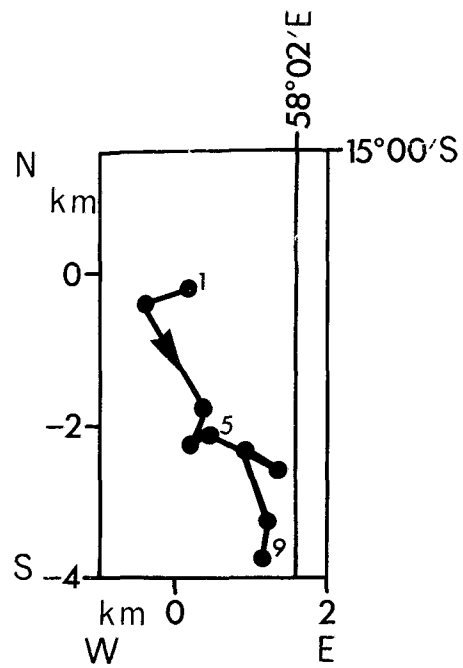
Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	31.III	1622	14°59' .6	58°02' .2	4.15	+0.2	-0.3	2.1	129
2	31.III	2026	14°59' .75	58°02' .3	8.2	+0.45	-1.0	3.8	087
3	1.IV	0513	14°59' .7	58°03' .0	17.0	+1.6	-0.95	4.3	263
4	1.IV	1139	14°59' .0	58°02' .4	23.4	+0.6	-1.05	5.1	029
5	1.IV	1736	14°59' .2	58°02' .7	29.35	+1.15	-0.1	0.6	056
6	2.IV	0256	14°59' .2	58°02' .8	38.7	+1.3	0.0	2.0	205
7	2.IV	1003	14°59' .45	58°02' .7	45.3	+1.1	-0.5	1.7	195
8	2.IV	2138	14°59' .3	58°02' .6	57.4	+0.9	-1.1	6.1	069
9	3.IV	0425	14°59' .5	58°03' .4	64.2	+2.3	-0.6		

Mean speed along trajectory = 3.0 cm/sec

Mean velocity, fixes 1 - 9, = 1.0 cm/sec, 083°T

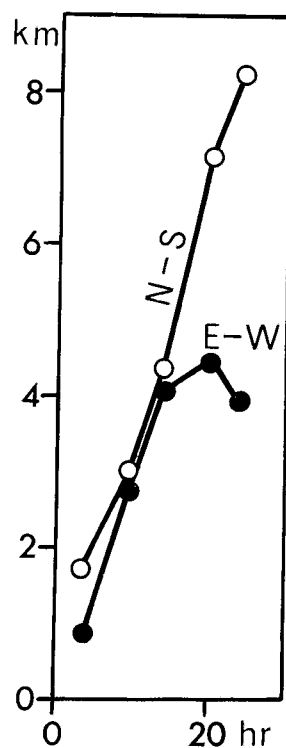
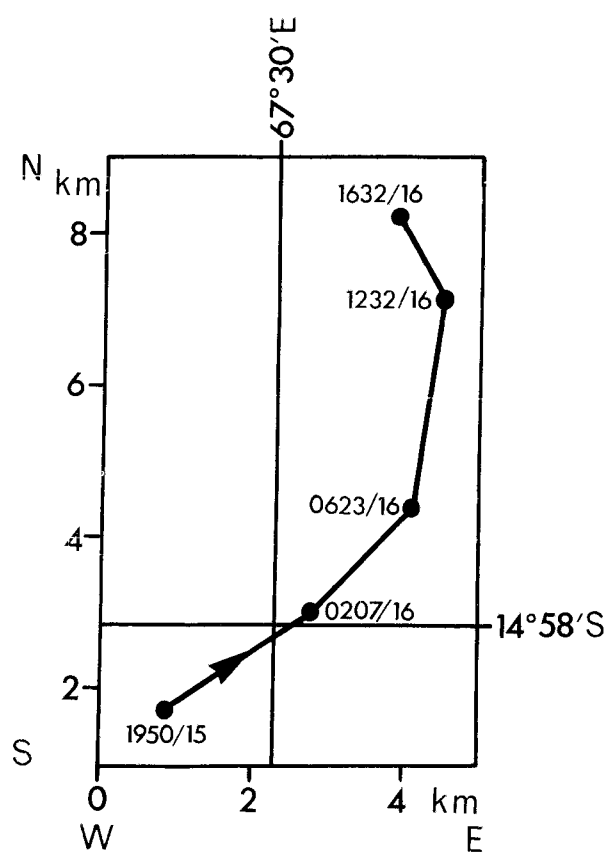
FLOAT DESIGNATION : 8

Date and time laid : 1240/31.11.64.



FLOAT DESIGNATION : 21

Date and time laid : 1629/15.IV.64.



SERIAL No: 151

FLOAT DESIGNATION: 21 (station 5323) Date and time laid: 1629/15.IV.64

Position laid: $14^{\circ} 59' .68$
 $67^{\circ} 28' .73$

Displacement origin: $14^{\circ} 59' .68$
 $67^{\circ} 28' .73$

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: Fixes 1 - 3: ± 0.2 km. Fixes 4,5: ± 0.5 km
(relative)

Depth(m):	Nominal	Observed	S.D.	S.D.(mean)
	1000	1370	± 200	± 70

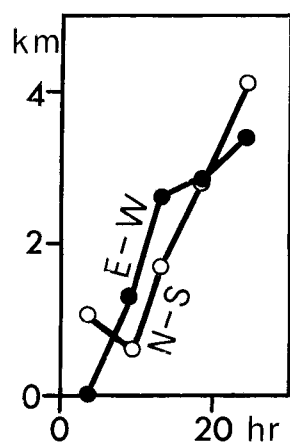
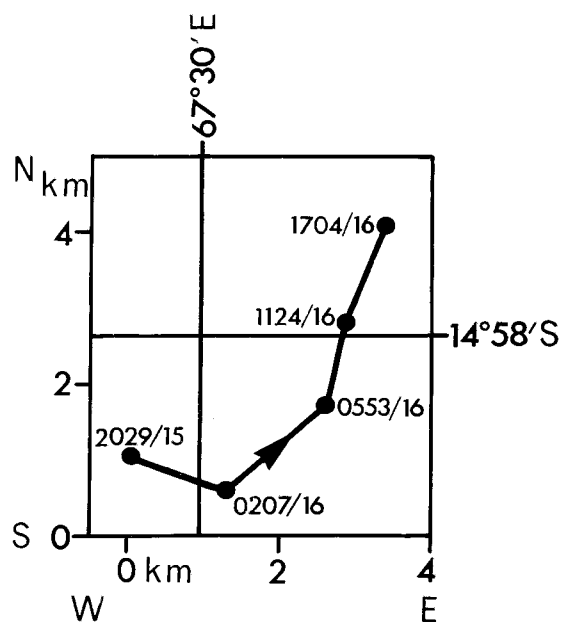
Fix No.	Date	Time GMT $\pm \frac{1}{2}$	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	15.IV	1950	$14^{\circ} 58' .6$	$67^{\circ} 29' .2$	3.35	+0.85	+1.7	11.0	056
2	16.IV	0207	$14^{\circ} 57' .9$	$67^{\circ} 30' .3$	9.65	+2.8	+3.0	11.8	044
3	16.IV	0623	$14^{\circ} 57' .1$	$67^{\circ} 31' .0$	13.9	+4.1	+4.4	13.1	010
4	16.IV	1232	$14^{\circ} 55' .6$	$67^{\circ} 31' .3$	20.05	+4.5	+7.15	9.0	330
5	16.IV	1632	$14^{\circ} 55' .0$	$67^{\circ} 30' .9$	24.05	+3.9	+8.25		

Mean speed along trajectory = 11.4 cm/sec

Mean velocity, fixes 1 - 5, = 9.9 cm/sec, $025^{\circ} T$

FLOAT DESIGNATION : 15

Date and time laid : 1651/15.IV.64.



FLOAT DESIGNATION: 15 (station 5320) Date and time laid: 1651/15.IV.64

Position laid: $14^{\circ} 59' .58$ Displacement origin: $14^{\circ} 59' .58$
 $67^{\circ} 29' .5E$ $67^{\circ} 29' .5E$

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.2 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 2000 1930 ± 360 ± 110

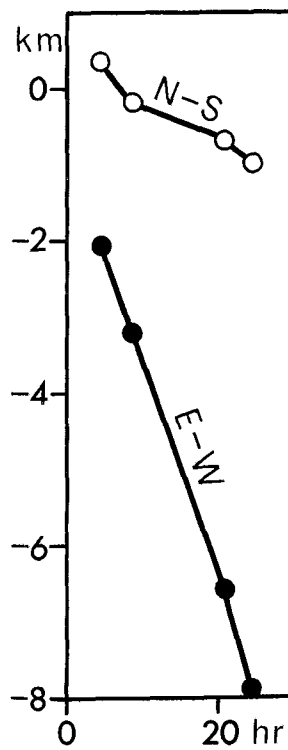
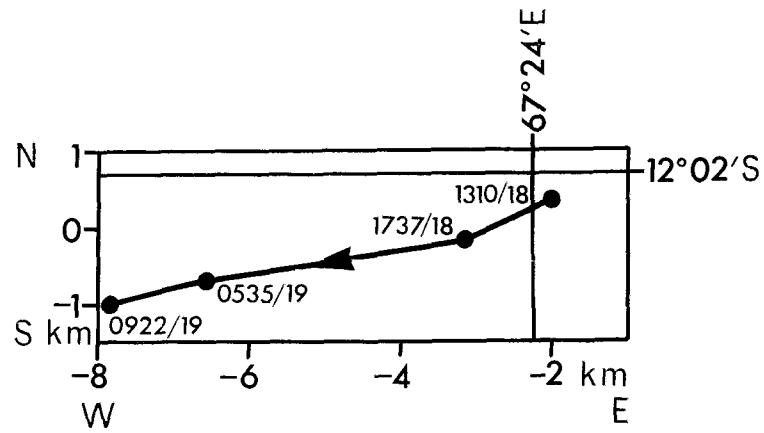
Fix No.	Date	Time GMT +4 ^h 2	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	15.IV	2029	$14^{\circ} 58' .9$	$67^{\circ} 29' .5$	3.65	+0.05	+1.05	6.9	109
2	16.IV	0207	$14^{\circ} 59' .15$	$67^{\circ} 30' .2$	9.25	+1.3	+0.6	12.6	050
3	16.IV	0553	$14^{\circ} 58' .6$	$67^{\circ} 31' .0$	13.05	+2.6	+1.7	6.1	014
4	16.IV	1124	$14^{\circ} 57' .9$	$67^{\circ} 31' .1$	18.55	+2.85	+2.8	6.9	022
5	16.IV	1704	$14^{\circ} 57' .2$	$67^{\circ} 31' .4$	24.2	+3.4	+4.1		

Mean speed along trajectory = 7.7 cm/sec

Mean velocity, fixes 1 - 5, = 6.2 cm/sec, 043°T

FLOAT DESIGNATION : 22

Date and time laid : 0850/18.IV.64.



FLOAT DESIGNATION: 22 (station 5335) Date and time laid: 0850/18.IV.64

Position laid: 12° 02'·4S
67° 25'·3E

Displacement origin: 12° 02'·4S
67° 25'·3E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.2 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 1000 1150 ± 190 ± 60

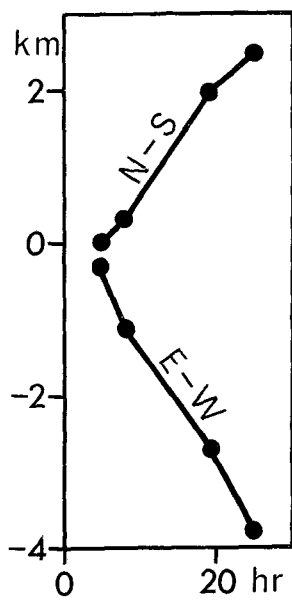
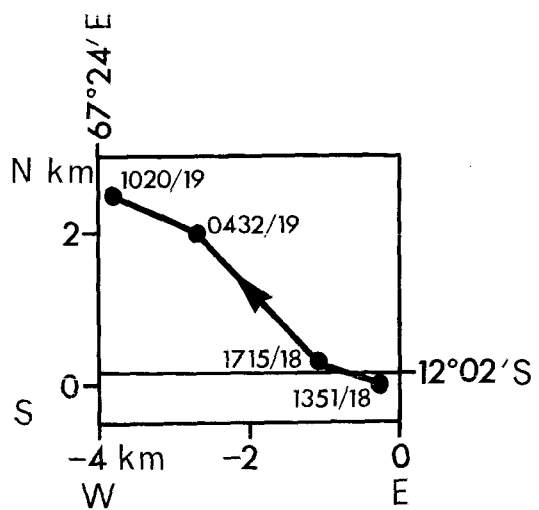
Fix No.	Date	Time GMT $\pm \frac{1}{2}$	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	18.IV	1310	12°02'·2	67°24'·1	4.35	-2.0	+0.35	8.1	246
2	18.IV	1737	12°02'·55	67°23'·5	8.8	-3.2	-0.2	8.4	262
3	19.IV	0535	12°02'·8	67°21'·5	20.75	-6.6	-0.7	10.2	257
4	19.IV	0922	12°03'·0	67°20'·8	24.55	-7.9	-1.0		

Mean speed along trajectory = 8.7 cm/sec

Mean velocity, fixes 1 - 4 = 8.7 cm/sec, 257°T

FLOAT DESIGNATION : 13

Date and time laid : 0915/18.IV.64.



FLOAT DESIGNATION: 13 (station 5335) Date and time laid: 0915/18.IV.64
 Position laid: 12° 02'.1S Displacement origin: 12° 02'.1S
 67° 26'.3E 67°26'.3E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.2 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 2000 1910 ± 430 ± 140

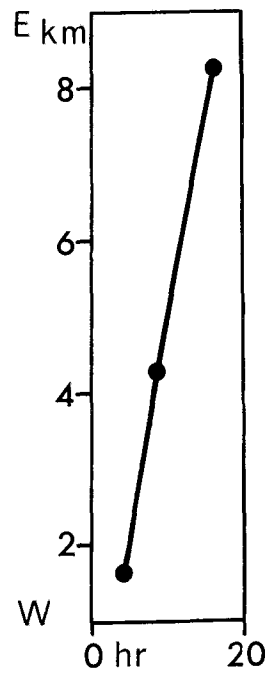
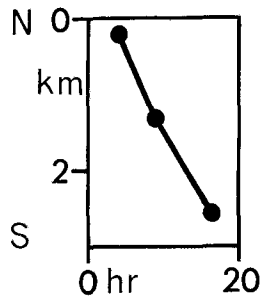
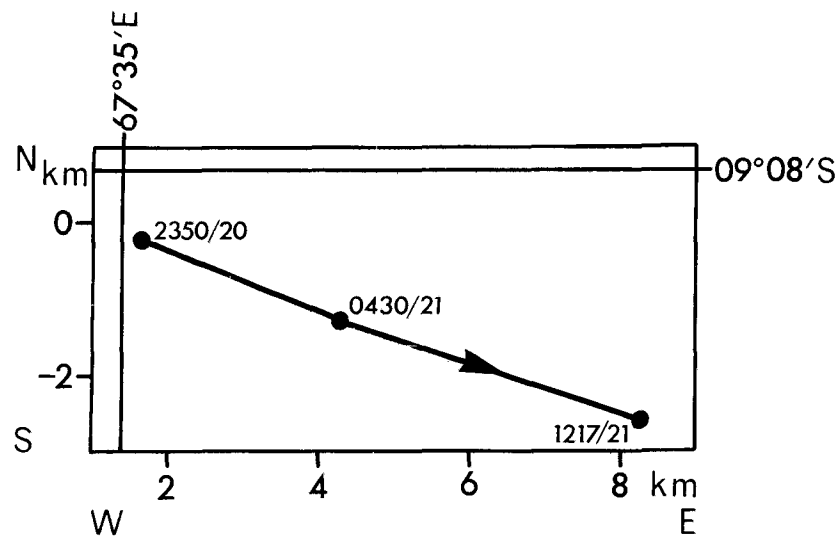
Fix No.	Date	Time GMT +4 $\frac{1}{2}$	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	18.IV	1351	12°02'.1	67°26'.1	4.6	-0.25	0.0	7.4	287
2	18.IV	1715	12°01'.9	67°25'.7	8.0	-1.1	+0.3	5.9	317
3	19.IV	0432	12°01'.0	67°24'.8	19.3	-2.7	+2.0	6.2	295
4	19.IV	1020	12°00'.7	67°24'.1	25.1	-3.8	+2.5		

Mean speed along trajectory = 6.2 cm/sec

Mean velocity, fixes 1 - 4, = 6.0 cm/sec, 305°T

FLOAT DESIGNATION : 20

Date and time laid : 1941/20.IV.64.



FLOAT DESIGNATION: 20 (station 5341) Date and time laid: 1941/20.IV.64

Position laid: $9^{\circ} 08' .4S$
 $67^{\circ} 34' .2E$

Displacement origin: $9^{\circ} 08' .4S$
 $67^{\circ} 34' .2E$

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.3 km (relative)

Depth(m):	Nominal	Observed	S.D.	S.D.(mean)
	1000	980	± 170	± 80

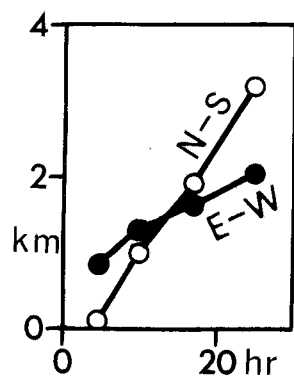
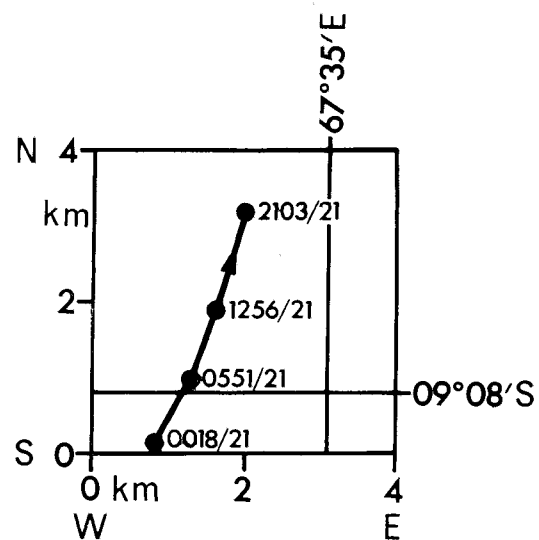
Fix No.	Date	Time GMT $+4\frac{1}{2}$	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	20.IV	2350	$9^{\circ}08' .5$	$67^{\circ}35' .1$	4.15	+1.6	-0.2	17.9	112
2	21.IV	0430	$9^{\circ}09' .15$	$67^{\circ}36' .6$	8.8	+4.3	-1.3	15.3	108
3	21.IV	1217	$9^{\circ}09' .9$	$67^{\circ}38' .85$	16.6	+8.3	-2.6		

Mean speed along trajectory = 16.3 cm/sec

Mean velocity, fixes 1 - 3, = 16.3 cm/sec, $110^{\circ}T$

FLOAT DESIGNATION : 29

Date and time laid : 2000/20.IV.64.



FLOAT DESIGNATION: 29 (station 5341) Date and time laid: 2000/20.IV.64
 Position laid: 9° 08'.4S Displacement origin: 9° 08'.4S
 67° 33'.3E 67° 33'.3E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.2 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 2000 2030 ± 480 ± 140

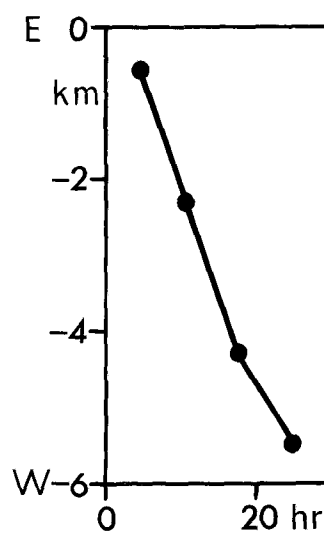
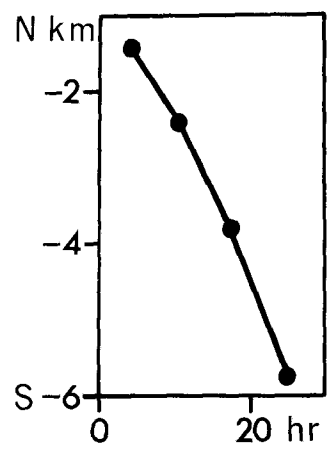
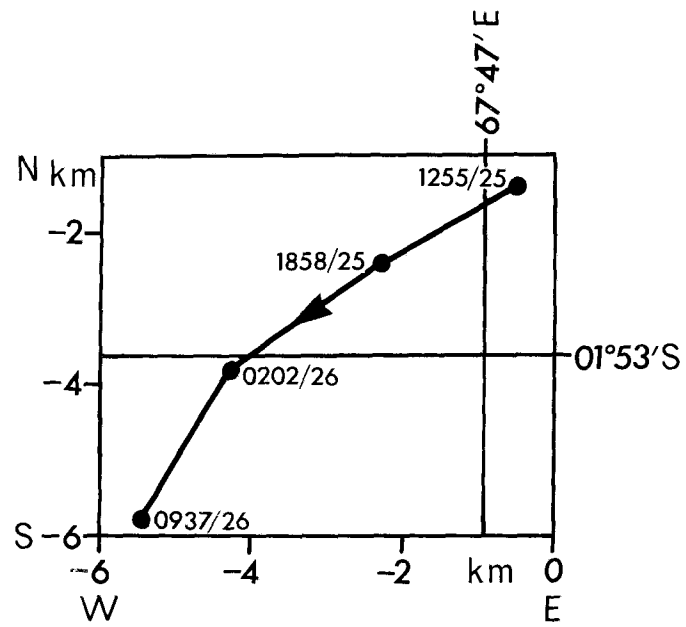
Fix No.	Date	Time GMT $\pm \frac{1}{2}$	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	21.IV	0013	9°08'.35	67°33'.7	4.3	+0.8	+0.1	5.0	030
2	21.IV	0551	9°07'.9	67°34'.0	9.85	+1.3	+1.0	3.9	020
3	21.IV	1256	9°07'.4	67°34'.2	16.95	+1.6	+1.9	4.8	016
4	21.IV	2103	9°06'.6	67°34'.4	25.05	+2.0	+3.2		

Mean speed along trajectory = 4.6 cm/sec

Mean velocity, fixes 1 - 4, = 4.6 cm/sec, 021°T

FLOAT DESIGNATION : X

Date and time laid : 0843/25.IV.64.



SERIAL No: 157

FLOAT DESIGNATION: X (station 5355) Date and time laid: 0843/25.IV.64
 Position laid: 1° 51'.0S Displacement origin: 1° 51'.0S
 67° 47'.5E 67° 47'.5E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.2 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 1000 1100 380 120

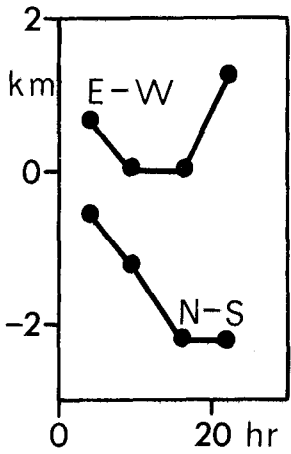
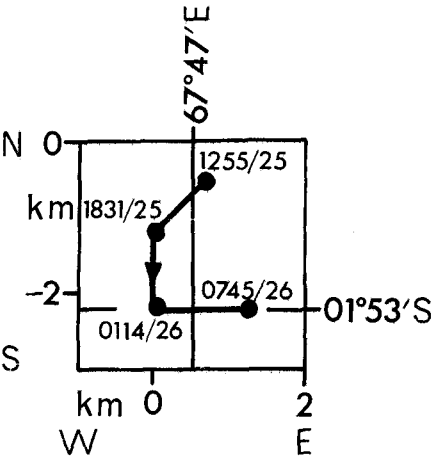
Fix No.	Date	Time GMT $\pm \frac{1}{2}$	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities Between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W	+N-S		
1	25.IV	1255	1°51'.8	67°47'.25	4.2	-0.5	-1.4	9.6	243
2	25.IV	1358	1°52'.3	67°46'.2	10.25	-2.3	-2.4	9.9	234
3	26.IV	0202	1°53'.1	67°45'.1	17.3	-4.3	-3.8	8.4	211
4	26.IV	0937	1°54'.2	67°44'.5	24.9	-5.5	-5.8		

Mean speed along trajectory = 9.3 cm/sec,

Mean velocity, fixes 1 - 4 = 9.1 cm/sec, 229°T

FLOAT DESIGNATION : 16

Date and time laid : 0910/25.IV.64.



Float DESIGNATION: 16 (station 5355) Date and time laid: 0910.25.IV.64

Position laid: $1^{\circ}51'.7S$
 $67^{\circ}46'.7E$ Displacement origin: $1^{\circ}51'.7S$
 $67^{\circ}46'.7E$

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.2 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 500 670 ± 170 ± 60

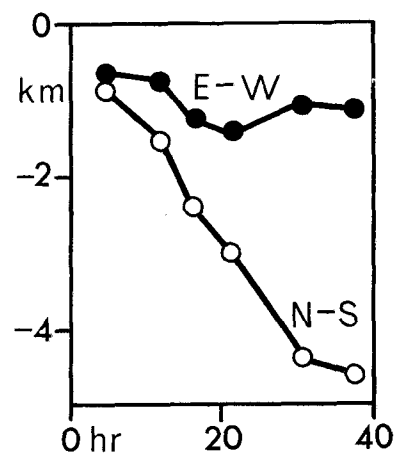
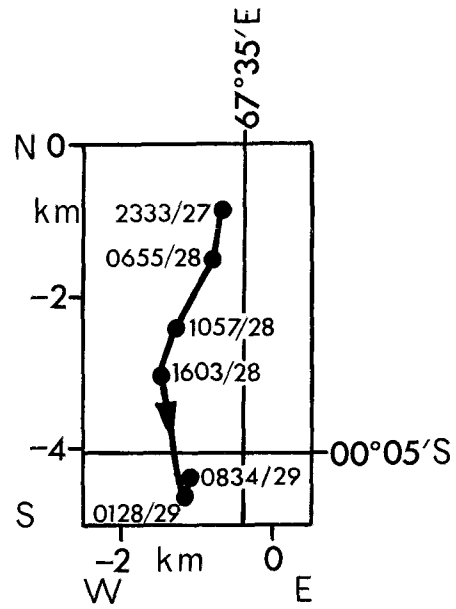
Fix No.	Date	Time GMT +4 ^h	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	25.IV	1255	$1^{\circ}52'.0$	$67^{\circ}47'.1$	3.75	+0.7	-0.5	5.0	230
2	25.IV	1831	$1^{\circ}52'.4$	$67^{\circ}46'.7$	9.35	0.0	-1.2	4.1	177
3	26.IV	0114	$1^{\circ}52'.9$	$67^{\circ}46'.7$	16.05	0.0	-2.2	5.6	092
4	26.IV	0745	$1^{\circ}53'.0$	$67^{\circ}47'.4$	22.6	+1.3	-2.2		

Mean speed along trajectory = 4.9 cm/sec

Mean velocity, fixes 1 - 4, = 2.7 cm/sec, 162°T

FLOAT DESIGNATION : 17

Date and time laid : 1846/27.IV.64.



SERIAL No: 159

FLOAT DESIGNATION: 17 (station 5359) Date and time laid 1846/27.IV.64

Position laid: 0° 02'.8S
67° 35'.2E

Displacement origin: 0° 02'.8S
67° 35'.2E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.3 km (relative)

Depth(m):	Nominal	Observed	S.D.	S.D.(mean)
	1000	1030	270	70

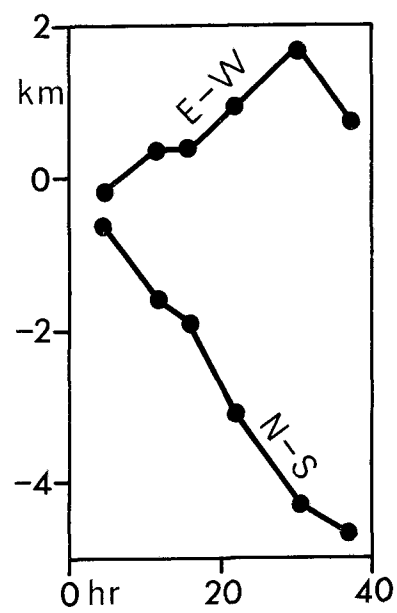
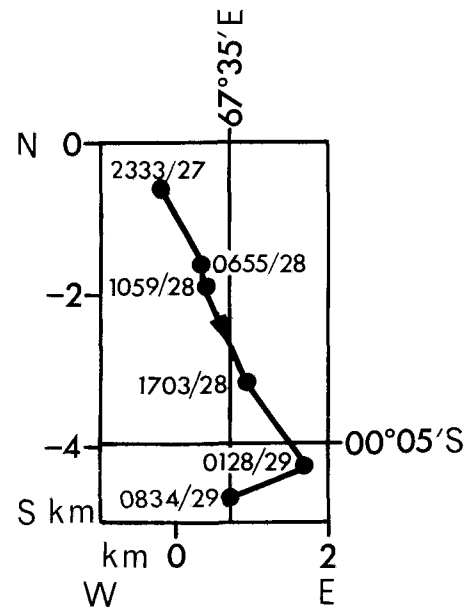
Fix No.	Date	Time GMT $\pm \frac{1}{2}$	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E-W x	+N-S y		
1	27.IV	2333	0°03'.3	67°34'.8	4.8	-0.7	-0.85	2.6	192
2	28.IV	0655	0°03'.65	67°34'.7	12.15	-0.8	-1.5	6.9	209
3	28.IV	1057	0°04'.1	67°34'.4	16.2	-1.3	-2.4	3.8	199
4	28.IV	1603	0°04'.45	67°34'.3	21.3	-1.5	-3.0	5.0	167
5	29.IV	0128	0°05'.3	67°34'.5	30.7	-1.2	-4.6	0.8	015
6	29.IV	0834	0°05'.2	67°34'.55	37.8	-1.1	-4.4		

Mean speed along trajectory = 3.6 cm/sec

Mean velocity, fixes 1-6, = 3.0 cm/sec, 187°T

FLOAT DESIGNATION : 28

Date and time laid : 1910/27.IV.64.



FLOAT DESIGNATION: 28 (station 5359) Date and time laid: 1910/27.IV.64
 Position laid: 0° 02'.9S Displacement origin: 0° 02'.9S
 67° 34'.6E 67° 34'.6E

Navigation based on: Radar on anchored buoy

Estimated accuracy of positions: ± 0.3 km (relative)

Depth(m): Nominal Observed S.D. S.D.(mean)
 2000 1760 480 120

Fix No.	Date	Time GMT +4 ^h ₂	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.S.	Long.E.		+E- x	+N-S y		
1	27.IV	2333	0°03'.2	67°34'.5	4.4	-0.2	-0.6	4.5	151
2	28.IV	0655	0°03'.75	67°34'.8	11.75	+0.35	-1.6	2.1	176
3	28.IV	1059	0°03'.9	67°34'.8	15.8	+0.35	-1.9	6.4	159
4	28.IV	1703	0°04'.6	67°35'.1	21.9	+0.9	-3.15	4.6	145
5	29.IV	0128	0°05'.2	67°35'.5	30.3	+1.7	-4.3	4.7	246
6	29.IV	0834	0°05'.5	67°35'.0	37.4	+0.7	-4.7		

Mean speed along trajectory = 4.6 cm/sec

Mean velocity, fixes 1 - 6, = 3.6 cm/sec, 168°T

